Radiological Localisation of Breast lesions prior to Surgery

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ABSTRACT

The aim, indications, timing, method of guidance, illustrated technique of mammographic guidance and surgical precautions for Localisation of breast lesions are discussed.

THE AIM OF THE PROCEDURE

The aim is to provide a tract to guide the surgeon towards the lesion with resultant conservative surgery.

THE INDICATIONS FOR THE PROCEDURE

The indications for the technique are:

(1) IMPALPABLE (OCCULT) BREAST LESIONS

These may be small lesions:
1) detected on survey in normal population
2) picked up on routine check-ups
3) due to improved quality of mammographic examinations in which the small lesion, usually less than 1cm, is impalpable, in the latter cases this may be due to large breasts in which nodules, particularly if deep are more difficult to palpate.

As a rule lesions for localisation should be benign nodules so that lumpectomy or nodule excision is carried out without sacrificing a large portion of breast. However, malignant lesions are also suitable for localisation, if impalpable, particularly if lumpectomy and radiotherapy is considered as opposed to radical mastectomy. On most occasions in the initial stage only a radiological diagnosis is known to the surgeon.

(2)LESIONS WITH MICROCALCIFICATION

If there is a strong suspicion of concomitant malignancy. These usually present as nodules containing microcalcification and not as microcalcifications on their own.

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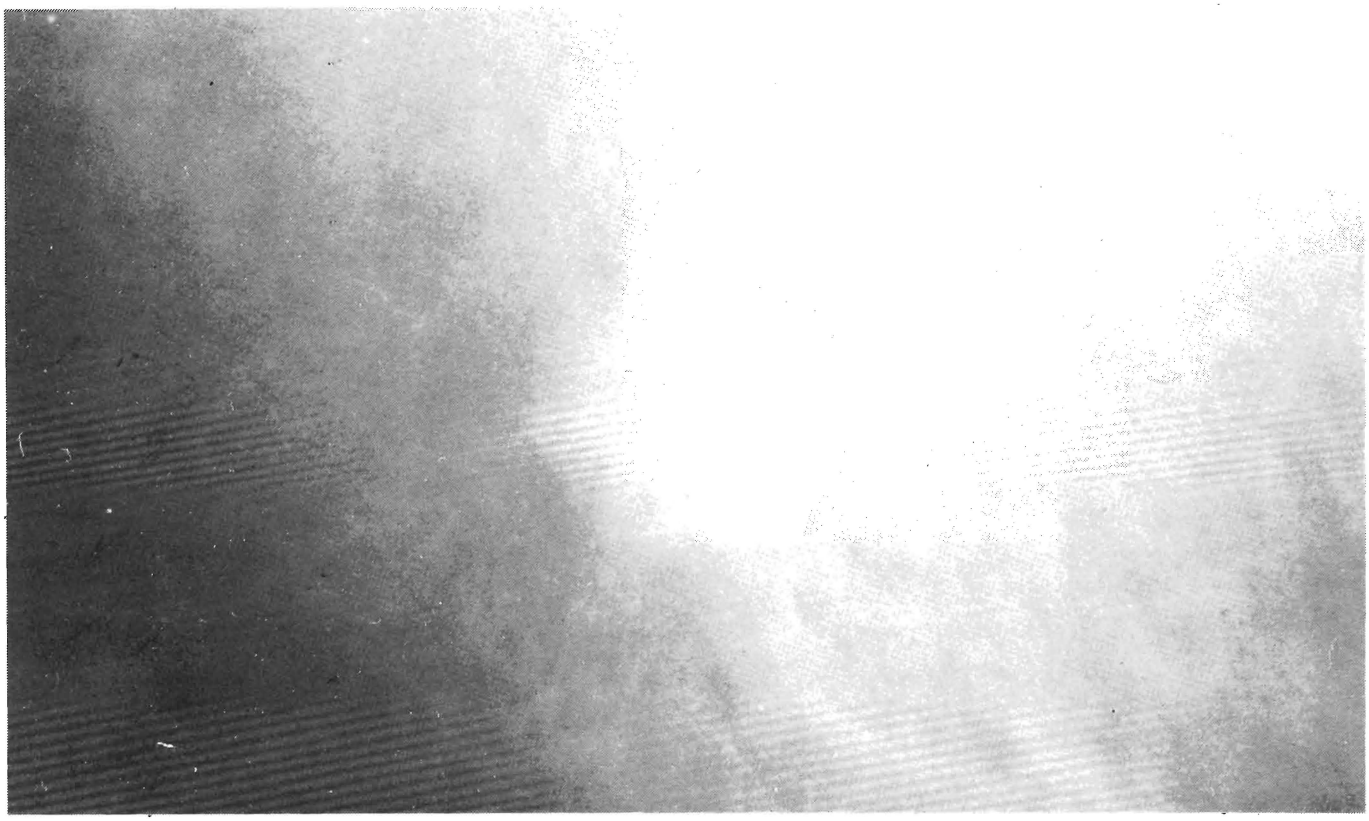

Figure 1
Cranio Caudal Mammogram. The nodule is irregular in outline and was radiologically diagnosed as a Carcinoma, which was proved correct on histology.

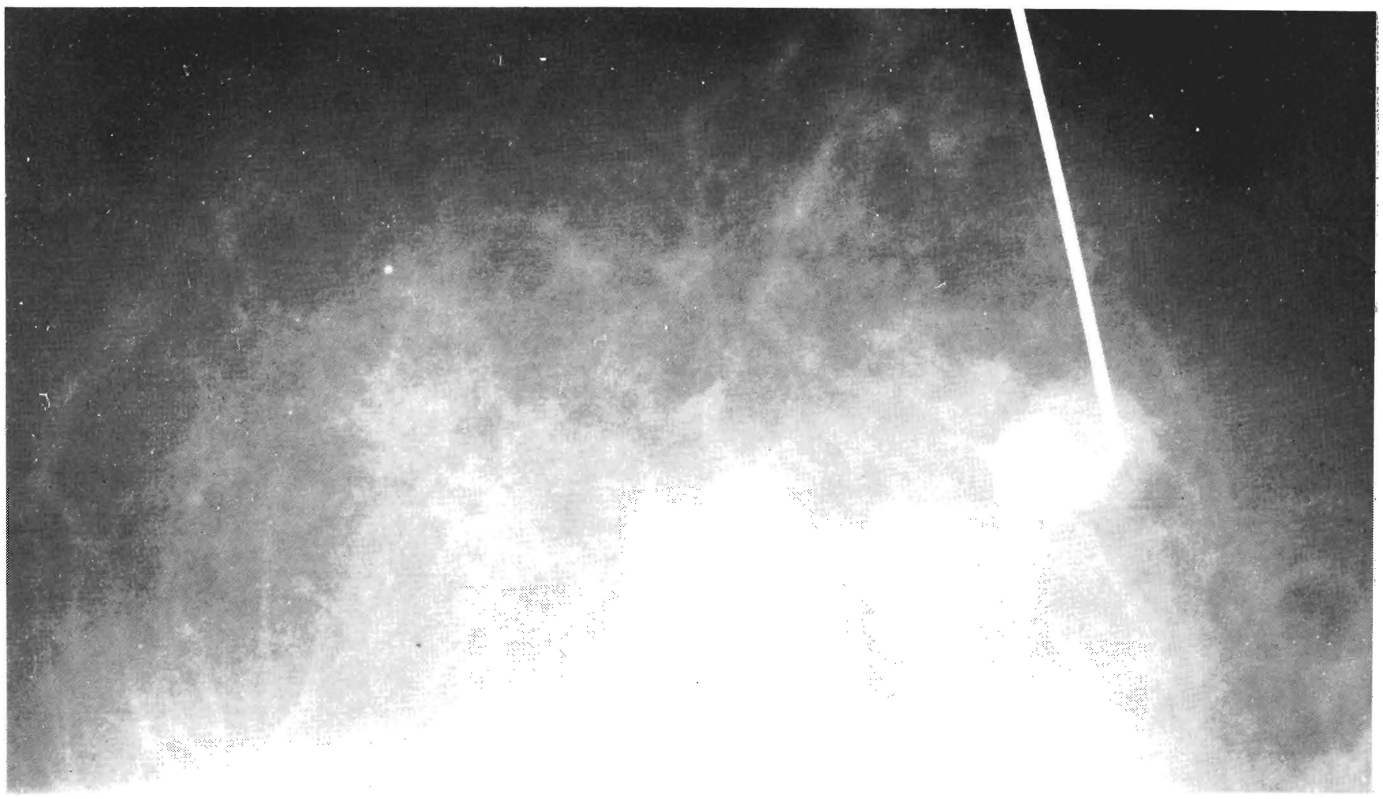

Figure 2
Shows a Fibroadenoma containing multiple calcifications with the localising needle within it.

TIMING

Ideally this procedure is done on the day of the operation but can be done on the day before if sterility is meticulous.

METHOD OF GUIDANCE

There are two main methods of guidance for localisation:

1) *Ultrasonic Guidance*

Ultrasonic guidance is usually more suitable to avoid radiation to the patient and physician. This has to be kept in mind by the surgeon and a request for ultrasonic assessment of lesions which are suitable for Localisation is indicated. Ultrasonic examination will detect cystic lesions, however it is not very useful in differentiating benign from malignant nodules except if these are cysts.

2) *Mammographic Guidance*

TECHNIQUE (Under mammographic guidance)

Locally, we are using the Disposable Kopan's Breast Lesion Localisation Needles. (Cook) These are available in 19,20 and 21 Gauge and 5,9 and 15 cms in length.

After review of the mammograms in cranio-caudal (Figure 1) and medio-lateral views the needle is inserted in the direction of the nodule via a periareolar puncture. Local anesthesia may be used but is not essential.

Cranio-Caudal Mammography is repeated and the position of the needle tip is assessed and if necessary the needle is readjusted and a repeat mammogram is taken until the needle tip is within the nodule (Figure 2). This is repeated also utilising medio-lateral mammography, thus assessing the needle tip position in two planes.

Once the needle is in the nodule a small syringe is placed at the hub and aspiration will confirm whether the nodule is cystic. If fluid is aspirated the patient will not need the planned operation. If no fluid is withdrawn one then inserts the wire with the bent tip forward. A mark on the wire will indicate when the wire tip reaches the needle tip. The wire is then inserted a slight distance further so that the hook of the wire will protrude beyond the needle bevel. On withdrawal the kink in the wire will stick at the needle bevel and this will be felt as a resistance to backward pull on the wire. At this point the wire tip and hook is localised within the lesion and withdrawal of the needle will then leave the wire in place (Figure 3). Repeat Cranio-Caudal and Medio-Lateral mammography will confirm exact centering of the wire hook. The patient can then be sent to theatre after covering the puncture site and the wire for sterility. After surgery radio-opaque nodules such as those with microcalcification can be radiographed to assess complete removal (Figure 4).

SURGICAL PRECAUTIONS

The wire is quite strong but the surgeon should try to avoid cutting it or touching it with electrocautery.

Figure 3
Demonstrates a carcinoma with localising wire angle within the nodule. This is the same patient as in Figure 1.

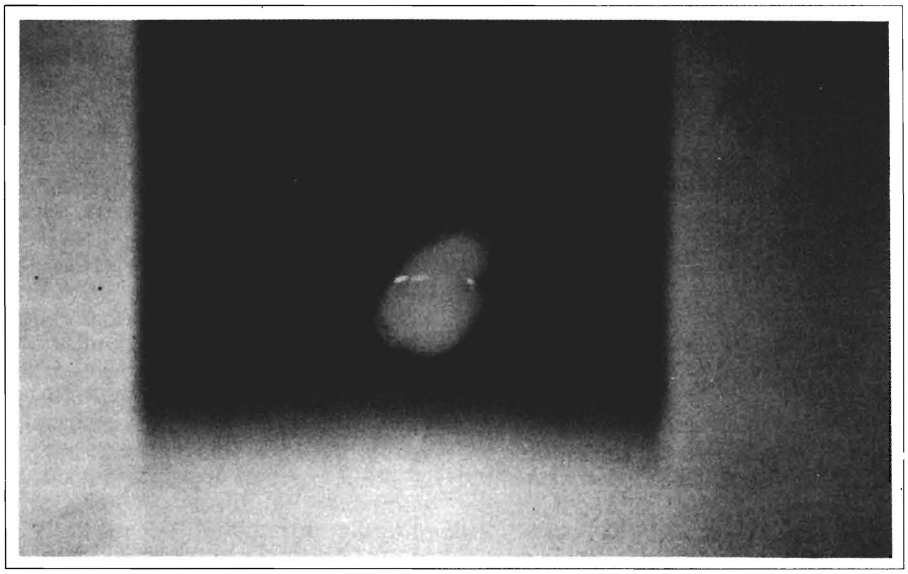

Figure 4
This is the specimen after excision. This fibroadenoma is magnified X4 and confirms the extent of conservative excision. This is the same patient as in Figure 2.

REFERENCES

1. HOMER M.J., FISHER D.M., SURGARMAN H.J. POST-LOCALIZATION NEEDLE BREAST BIOPSY OF NON-PALPABLE LESIONS. RADIOLOGY 1981; 140:241-242.

2. KOPANS D.B, DE LUCA S.A. A MODIFIED NEEDLE-HOOKWIRE TECHNIQUE TO SIMPLIFY PREOPERATIVE LOCALISATION OF OCCULT BREAST LESIONS. RADIOLOGY 1980; 134:781.